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10/582,513	06/09/2006	Takanori Yamagishi	292380US0PCT	2912
22850	7590	04/08/2011	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			EOFF, ANCA	
			ART UNIT	PAPER NUMBER
			1722	
			NOTIFICATION DATE	DELIVERY MODE
			04/08/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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DETAILED ACTION

1. Claims 17-28 are pending. Claims 1-16 have been cancelled.
2. The foreign priority document JP 2003-413627 filed on December 11, 2003 was received and acknowledged.

Continued Examination Under 37 CFR 1.114

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 24, 2011 has been entered.

Claim Objections

4. Claims 20, 21, 27 and 28 are objected to because of the following informalities:

Claims 20 and 21 recite the limitation "resist polymer solution". In view of the teachings on page 18, lines 11-12 of the specification and in order to be consistent with the language of claim 17, the limitation is interpreted as "purified resist polymer solution".

Claims 27 and 28 recite the limitation:

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solvent (a) is propylene glycol monomethyl ether acetate, ethyl lactate, cyclohexanone, methyl amyl ketone, diethylene glycol dimethyl ether, diethylene glycol monoethyl ether, and γ -butyrolactone.

In view of the teachings on page 16, lines 4-14 of the specification, the limitation is interpreted as solvent (a) is one or more of the solvents selected from the group consisting of propylene glycol monomethyl ether acetate, ethyl lactate, cyclohexanone, methyl amyl ketone, diethylene glycol dimethyl ether, diethylene glycol monoethyl ether and γ -butyrolactone.

Appropriate correction is required.

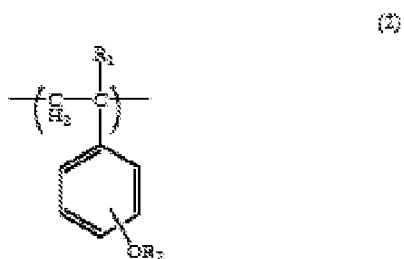
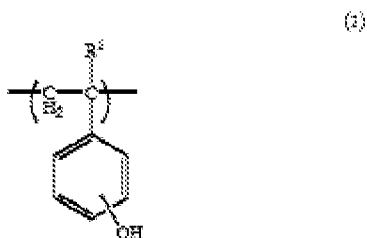
Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 17-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyaji et al. (US 2002/0058201) in view of Zampini et al. (US Patent 5,939,511).

With regard to claims 17-19, Miyaji et al. teach a resin comprising the units (1) and (2):



, wherein R₂ is a C₄₋₁₀ tertiary alkyl (abstract,
par.0040).

The tertiary C₄₋₁₀ alkyl groups of Miyagi et al. (see par.0040) are groups decomposed by the action of an acid, as taught on page 8, lines 9-13 of the specification of the instant application

Therefore, the copolymer comprising the units (1) and (2) of Miyagi et al. is equivalent to the resist polymer of claim 17 of the instant application, wherein:

-the unit (1) is equivalent to the polar group-containing repeating unit of claim 17,
and

-the unit (2) is equivalent to the repeating unit decomposable by, and becoming alkali-soluble by, the action of an acid of claim 17.

Miyagi et al. teach that R₂ may be a methycyclohexyl, 1-ethylcyclohexyl, 1-methylcyclopentyl group (par.0040). These groups meet the limitation of claim 18 for "the repeating unit decomposable by the action of an acid and becoming alkali-soluble contains alicyclic skeleton having 5-20 carbon atoms".

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The unit (1) of Miyaji et al. meets the limitation of claim 19 for “the polar group-containing repeating unit comprises a phenolic hydroxyl polar group”.

Miyaji et al further teach that is preferable if the resins comprise no impurities such as halogens or metals, in order to improve the sensitivity, resolution, process stability, pattern shape (par.0640).

Miyaji et al. further teach that the resin may be purified by a liquid-liquid extraction process (par.0640) but fail to specifically teach the steps of such process.

Zampini et al. teach a resin purification process, wherein said resins are used for photoresist coatings (abstract).The resins may be purified in a liquid-liquid extraction process (column 12, lines 44-45), which removes halides and metal impurities (column 13, lines 40-46).

The liquid-liquid extraction of Zampini et al. comprises the following steps:

- dissolving the resin in a solvent, such as ethyl acetate (column 12, lines 45-52 and column 13, lines 3-4);

- performing liquid-liquid extraction;

- diluting the solution with a photoresist solvent such as propylene glycol monomethyl ether acetate and remove the unwanted solvent (ethyl acetate) by vacuum distillation (column 13, lines 5-16).

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the process of Zampini et al. for the purification of the resin of Miyaji et al., in order to remove halides and metal impurities and to improve the sensitivity, resolution, process stability, pattern shape (see Miyaji et al., par.0640).

The step of dissolving the resin in ethyl acetate is equivalent to the step (1) of claim 17, wherein ethyl acetate is equivalent to the solvent (b) of claim 17.

The step of diluting the solution with a photoresist solvent such as propylene glycol monomethyl ether acetate and removing the unwanted solvent (ethyl acetate) by vacuum distillation is equivalent to the step (2) of claim 17, wherein propylene glycol monomethyl ether acetate is equivalent to the solvent (a) of claim 17.

Zampini et al. further show that the distillation in vacuum may be performed at a temperature of 50-70°C (see Example 18 in column 14). This temperature is within the range of claim 17 of the instant application.

The boiling point of ethyl acetate (solvent (b)) is 77.1°C and the boiling point of propylene glycol monomethyl ether acetate (solvent (a)) is 146°C. Therefore, the limitation of claim 17 for “the boiling point of solvent (b) is not higher than the boiling point of solvent (a) at atmospheric pressure” is met.

Zampini et al. show that the amount of impurities is less than 20 ppm of the solution, preferably less than 10 ppm (column 13, lines 41-46). Therefore, the limitation of claim 17 for “the amount of impurities having a boiling point at atmospheric pressure of not more than the boiling point of the solvent (a) is 1 mass% or less of the resist polymer in the purified resist polymer solution” is met.

With regard to claims 20 and 21, Zampini et al. teach that the amount of purified polymer in the solution is 35-38% (see Example 18, column 14), which is within the range of claim 20.

This amount is not within claim 21. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to obtain a solution with a lower concentration of purified polymer if the concentration of polymer solution subjected to purification is lower (see column 12, lines 59-60 of Zampini et al.).

With regard to claim 22, the copolymers comprising the units (1) and (2) of Miyaji et al., wherein R_2 is a tertiary alkyl group with 4-10 carbon atoms (par.0040) is equivalent to the polymer of the instant application, which comprises:

- a decomposable unit A, wherein the unit A is a hydroxystyrene alkali-soluble unit protected with an acid-dissociable protective group (see pages 7 and 8 of the specification of the instant application) and
- an unit B, which is a hydroxystyrene unit (see page 9, lines 13-17 of the specification).

The ethyl acetate is one of the solvents (b) of the instant application (see page 16, lines 15-20 of the specification).

The propylene glycol monomethyl ether acetate is one of the solvents (a) of the instant application (see page 16, lines 10-11 of the specification).

Therefore, absent a record to the contrary, it is the examiner's position that the copolymer comprising unit (1) and (2) of Miyaji et al. has a greater rate of dissolution in ethyl acetate (solvent (b)) than in propylene glycol monomethyl ether acetate (solvent (a)).

*"[T]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer." *Atlas Powder Co. v. Ireco Inc.*, 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999). Thus the claiming of

a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). (MPEP 2112.I. SOMETHING WHICH IS OLD DOES NOT BECOME PATENTABLE UPON THE DISCOVERY OF A NEW PROPERTY)

With regard to claims 23-24, Zampini et al. shows that the distillation in vacuum may be performed at a temperature of 50-70°C (see Example 18 in column 14). This range overlaps the ranges of claims 23 and 24 of the instant application.

With regard to claim 25, Zampini et al. shows that the amount of impurities is less than 20 ppm of the solution, preferably less than 10 ppm (column 13, lines 41-46). Therefore, the limitation of claim 25 for "the amount of impurities having a boiling point at atmospheric pressure of not more than the boiling point of the "solvent (a) is 0.5 mass% or less of the resist polymer in the purified resist polymer solution" is met.

With regard to claims 26-28, the ethyl acetate of Zampini et al. is equivalent to the solvent (b) of claims 26 and 28.

The propylene glycol monomethyl ether acetate of Zampini et al. is equivalent to the solvent (a) of claims 27 and 28.

Response to Arguments

7. Applicant's arguments, see pages 6-8 of the Remarks filed on February 24, 2011, with respect to the rejection of claim 17 under 35 USC 103 (a) over Sounik et al. (US 2004/0242798) in view of Sehm (US Patent 4,420,610) and in further view of Zampini et al. (US Patent 5,939,511) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a

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new ground of rejection is made in view of Miyaji et al. (US 2002/0058201) in view of Zampini et al. (US Patent 5,939,511).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANCA EOFF whose telephone number is (571)272-9810. The examiner can normally be reached on Monday-Thursday, 6:30 AM-4:00 PM, EST and Friday, 6:30-10:30 AM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anca Eoff/

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